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COVER: Removal of asbestos from the frigate USS *Ainsworth* at the Philadelphia Naval Shipyard. One member of the rip-out crew handles a vacuum hose connected to the pierside vacuum unit and sprays the work area with water mist.

Continuing Education for the Navy Medical Department

Continuing Education for all Navy Medical Department health care providers is an absolute necessity. All our corps officers—Medical, Nurse, Dental, and Medical Service as well as physician's assistants must be conversant with updated quality information in order to maintain a high standard of medical service and support for the beneficiaries of the Navy health care system. The rapid development of continuing education requirements for specialty board recertification, professional society membership, and the requirements of the Joint Commission on the Accreditation of Hospitals, must be fulfilled in order to document professional competency.

Since 1976, conference travel funds have been increased significantly. I am well aware that the total amount is not yet adequate to provide each and every individual a conference of his choice, and that the amount of funds available has not paralleled the increased costs of travel, per diem, and tuition.

This imposed deficit requires each of us to employ ingenuity and creativity in making use of available resources in order to meet continuing education requirements. Strong ties with local professional societies and universities, local guest lecture series, and the use of local command expertise can greatly augment our educational efforts. It should be policy to make wise use of conference dollars by limiting unnecessary travel and excessive tuition.

Continuing education programs should be designed to make them appropriate to the Naval Regional Medical Centers' patient care needs as well as the individuals' professional educational requirements. Local command educational efforts should supplement but not replace outside education programs.

I assure you that every effort is being made to increase our professional conference travel resources to meet the educational requirements of our professional staff.

I request your cooperation and assistance in developing a high quality continuing educational program that will supplement the educational needs and requirements we must continue to meet under the present constraints.

Assistance in developing your programs can be obtained by contacting the Naval Health Sciences Education and Training Command.

W.P. ARENTZEN
Vice Admiral, Medical Corps
United States Navy

Comic Relief Down Under

At the remote Naval Communication Station, Harold E. Holt, in Exmouth, Western Australia, a team of Navy wives and active duty personnel are donating their time and talents to brighten the base dispensary walls with beloved cartoon characters. The facility, on the Northeast Cape, is approximately 800 miles north of Perth and far removed from any of the conveniences and resources most Navy commands are able to rely upon. But the initiative, imagination, and talents of its military and civilian personnel certainly have not failed to meet the challenge.

The dispensary had just received a fresh coat of paint from the base Public Works Department, but

senior medical officer, LT David Detert, MC, realized that the job was more utilitarian than decorative. Something was needed to lift the spirits of people coming in for medical attention.

The answer was a self-help project calling for special talent. Dr. Detert challenged the Officers' Wives' Club with decorating the walls. Both the club and the medical department agreed to paint familiar cartoon characters, as these would be bright, cheery, and distracting, especially for young patients.

The club used the base newspaper and word of mouth to recruit people to draw the larger-than-life figures. Public Works supplied the paint.

Three Navy wives volunteered to draw and the editor of the base newspaper volunteered her efforts. Before long, Road Runner appeared in the waiting room and Charlie Brown and Lucy marked the locations of the appropriate restroom doors. Other cartoon characters materialized. Under the pharmacy windows, the Count leered as he held a prescription and a bottle of pills. A big molar with a toothbrush appeared near the dental treatment area. Other treatment areas were represented by a sick Cookie Monster, Donald Duck, Bugs Bunny, Big Bird, Snoopy, Woodstock, and appropriately enough, a Tasmanian Devil.

Those participating in the effort were Linda Dickerson, Diana Hamel, Jan Parnell, Sandy Shaw, Barbara Smith, Barbara Unterzuber, Kitty Jackson, Terry Ventura, Dental Technician Nathan Catterton, and Journalist Second Class Laura Hansen.

The project began in mid-November and the work was done on weekends and evenings to avoid disrupting the dispensary routine. Nevertheless, the artists completed the work by 21 December, when the dispensary's medical and dental departments hosted an open house for the base.

In late January, the women returned to work to continue the project on some of the rear corridors. Their morale-boosting efforts are typical of the cooperation that makes the remote station seem a bit closer to home.

NOTES & ANNOUNCEMENTS

ATTENTION NAVY AUTHORS

Many articles by Navy personnel appear each year in a variety of professional journals and other publications. *U.S. Navy Medicine* would like to include a monthly list of some of these articles written by Navy authors from all corps. If you have published recently and would like to share your research or perceptions with your colleagues, please send us the title, name, and issue of the publication in which your article appeared.

RESIDENCIES IN FORENSIC PATHOLOGY

The Armed Forces Institute of Pathology (AFIP) offers one year of advanced residency training in the special field of forensic pathology. The residency is available to active duty medical officers of the Army, Navy, and Air Force, who are either diplomates of the American Board of Pathology in anatomic pathology (preferably in both anatomic and clinical pathology), or eligible to take these examinations. Positions are available for the 1980-81 residency year. Interested persons should contact CAPT Robert L. Thompson, MC, USN, Department of Forensic Sciences, AFIP, Washington, D.C. 20306. Telephone: Autovon 291-3287, Commercial (202) 576-3287.

Applications must be submitted by 15 Aug 1979 in accordance with BUMEDINST 1520.10G and BUMEDNOTE 1520.

COURSE ON CARE FOR THE CANCER PATIENT

A postgraduate course on Strategies of Care for the Cancer Patient will be held 13-14 July 1979 at the Del Monte Hyatt House, Monterey, Calif.

The objective of this program is to assure the primary care physician's involvement as the key member of the treatment team for the cancer patient. The development of treatment strategies for both the clinical and psychosocial support of the cancer patient necessitates informed cooperation between the oncologist and the primary care physician. The continuum of care from risk determination through detection, treatment, and followup is an interdisciplinary effort that involves the primary care physician at every stage if the patient's treatment is to be "wholly successful."

The program is accredited by the AMA Category I of the Physicians Recognition Award and the Certification Program of the California Medical Association.

For more information write or call: Extended Programs in Medical Education, University of California, Room 569-U, Third and Parnassus Ave., San Francisco, Calif. 94143. Telephone (415) 666-4251.

VOLUMETRIC INFUSION PUMP

If your hospital uses the IMED 922 Volumetric Infusion Pump, the Naval Health Sciences Education and Training Command (HSETC) recommends you borrow the new videotape IMED 922 Volumetric Infusion Pump, T-451, 09 min. It describes the use and operation of the pump for administering intravenous fluids on a semi-automatic basis. The new videotape was recorded to help hospital staff understand the theory and practical operation of the IMED pump and has helped train and give reinforcement training to medical personnel in the field.

A videotape or film copy may be borrowed from HSETC Audiovisual Resources Division, Code 26, Bethesda, Md. 20014. Telephone Autovon 295-1226.

AIR AND SPACE MUSEUM EXHIBIT

From mid-April through October, the National Air and Space Museum will display artifacts relating to aerospace medicine. Items of interest will include WWII aircraft first aid and survival kits, post-landing survival equipment from the last Skylab mission, the current prototype of the Space Shuttle survival kit, and a model of the C9A Nightingale, the Air Force's flying hospital ward. The special mini-exhibit will be located on the first floor beneath the escalator nearest the theater.

NEW HEALTH CLINIC FOR CHERRY POINT

On 30 March 1979, ground was officially broken for the Occupational Health Clinic, Naval Hospital, Cherry Point, N.C. The new facility will cost close to a half million dollars and will occupy 6,000 square feet.

ERRATUM

In April's Department Rounds, RADM Clinton H. Lowery's last assignment should have been listed as Commanding Officer, Naval Regional Medical Center, Camp Pendleton. We regret the error.

CHINFO AWARD FOR NRMC PHILADELPHIA NEWSPAPER

Regional Reflections became the first naval medical facility publication to be cited for a CHINFO Merit Award since 1975. The award is based on the monthly's demonstration of high standards of excellence and its significant contribution to the Navy's internal information goals. Congratulations to LTJG Francis C. Brown, MSC, Assistant Public Affairs Officer for the Medical Center, HM3 Mark S. DiIonno, editor, and their staff.

NAVY PSYCHOLOGIST RECOGNIZED

The *American Psychologist* 34(1):56, Jan 1979, recognizes the exceptionally outstanding career of one of the first Navy psychologists, Arthur L. Benton, Ph.D. Dr. Benton, who retired on 1 July 1978 as Professor of Neurology at the University of Iowa College of Medicine, received the American Psychological Association Distinguished Professional Contribution Award for 1978, with the following citation:

"He is a scholar who has done much to stimulate interest in the history of thought about the brain and its role in perception and cognition, an investigator whose research over the past 40 years has helped to erect a new discipline, the neuropsychology of human cognition. Arthur L. Benton is a leader and one of the principal architects of neuropsychology, giving it direction, attracting students from many fields, setting standards of objectivity and experimental control where subjective methods previously prevailed, bringing scientific discipline and a sense of optimism to the now burgeoning field. His interests are uncommonly broad, and his writings and forceful discussion in many areas have had important influence on the thinking of neurologists, psychologists, and psychiatrists both in this country and in Europe, Japan, and Australia."

From 1941-1946, Dr. Benton served on active duty at several locations, among which were the Naval School of Aviation Medicine and the Naval Hospital, San Diego to which he was the first Navy psychologist assigned. It was in that assignment, with his early research on neurological and behavioral consequences of brain wounds, that Dr. Benton further established his lifelong commitment to the field of neuropsychology. With more than 150 scholarly scientific publications, and numerous professional honors to his credit, it is an honor for the Navy Medical Department that Dr. Benton also holds the rank of Captain, Medical Service Corps, United States Naval Reserve (Ret.).

NAVY ALCOHOL SAFETY ACTION PROGRAM

Alcohol misuse can be a problem in the areas of work performance, safety, and individual health. The Navy is taking positive action by providing commands with a Navy Alcohol Safety Action Program (NASAP). The course will be conducted during off-duty hours, two nights a week, in three-hour sessions, for six weeks. The curriculum is designed to provide basic information and student awareness of alcohol, drinking problems, alcoholism, and related legal, medical, and social aspects. Completion of the NASAP course is considered to be "off-duty education" and the student is awarded 3.6 continuing education units by the University of West Florida.

Medical Corps officers can obtain a maximum of 36 hours approved by the AMA Category I Continuing Medical Education. Nurse Corps officers are granted 36 contact hours by the Continuing Education Approval and Recognition Program at HSETC. Dental and Medical Service Corps officers and physician's assistants who successfully complete the curriculum may make applications to their respective professional associations for continuing education credits. Hospital corpsmen will receive 3.6 continuing education units from the University of West Florida.

NASAP locations and auxiliary classroom sites are as follows:

Location	*Auxiliary Site*
Alameda, Calif.	
Charleston, S.C.	
Great Lakes, Ill.	
Hawaii, Pearl Harbor	Barbers Point; Kaneohe Bay, Hi.
Jacksonville, Fla.	Mayport; Cecil Field, Fla.
New London, Conn.	Lakehurst, N.J.; Newport, R.I. Portsmouth, N.H.
Norfolk, Va.	Portsmouth; Oceana; Little Creek; Virginia Beach, Va.
Orlando, Fla.	
Pensacola, Fla.	Whiting Field; Corry Station, Fla.
San Diego, Calif.	
Seattle, Wash.	Bremerton; Bangor; Whidbey Island, Wash.
Washington, D.C.	Bethesda; Patuxent River, Md.; Quantico, Va.

Additional NASAP offices

Camp Pendleton, Calif.	Edzel, Scotland
Guam, MI (NAVSTA)	USS *Forrestal*
Rota, Spain	USS *Saratoga*
Holy Loch, Scotland	USS *Gilmore*
Subic Bay, RP	

Anyone wishing to attend the Navy Alcohol Safety Action Program should contact the nearest NASAP office. Additional information may be obtained by contacting: CDR G.A. Gunn, USNR, Program Coordinator, NASAP, Navy Alcohol Rehabilitation Center, Naval Station, San Diego, Calif. 92136. Telephone: Autovon 958-2127/2128/2129 or LTJG C.A. Cole, MSC, USNR, HSETC Code 23-1, Bethesda, Md. 20014. Telephone: Autovon 295-0250.

RADM Conder Retires

The Seventy-First for the Nurse Corps

This year marks the 71st anniversary of the Nurse Corps and the retirement of its director, RADM Maxine Conder. When U.S. Navy Medicine *interviewed RADM Conder during the Bicentennial year, she too was celebrating an important anniversary—her 25th year as a Navy nurse. Three years later we talked with her again about the Nurse Corps and her long, distinguished Navy career.*

USNM: RADM Conder, since we talked with you in '76 there have been significant changes in the Navy health care field, most notably the regionalization and reorganization of BUMED. What has the Nurse Corps done to cope with these changes?

RADM Conder: We have been forced to view our areas for performance beyond the four walls of a hospital. We expect our chief nurses or one of their representatives to make routine visits to all our dispensaries and clinics. Many of our nurses are now going aboard ships, perhaps for only a few hours, to conduct courses. Some of our men have been aboard carriers for as long as six weeks teaching and explaining the operation of sophisticated health equipment to medical personnel. Other Nurse Corps officers routinely conduct CPR courses for entire crews.

Also, if our doctors aboard ship get involved in surgical procedures, there will be a greater need for nurses. Having women assigned to shipboard duty may hasten a requirement for more nurse involvement aboard ship.

What structural changes have been required to accommodate the regionalization?

We've identified billets to support regionalization such as regional educational coordinators and we're now looking at regional ambulatory care coordinators. We have also put more emphasis and more billets into the outpatient area.

One of our most important areas for emphasis is career development for our senior nurses within the clinical areas. A nurse may now remain in ambulatory care, a clinical specialty, or in education and still have an opportunity for promotion to captain. This was not true in the past. They all had to go into administration. With regionalization and the broader scope for nursing service, we have been able to identify certain jobs that require that rank within the clinical fields. I firmly believe that the Director of Nursing Service position should be regionalized to provide the authority to move more freely within the region.

We're hearing more about physician's assistant programs and independent duty corpsmen taking on additional responsibilities in the health care field. What role do you see nurses playing in this new trend?

In the health care field it is recognized that people are demanding to be kept well rather than waiting to be made well. Health teaching is, therefore, very important. I am convinced and will tell everyone that our nurses are probably the best

teachers of any in the health field. Whereas our physician's assistants —and I think there is a great need for them—are very much disease oriented as are our physicians; our nurses are more directed toward health maintenance and health education. I see a tremendous need for health teaching such as in nutrition, especially for our young people in the Navy. Nurses are going to become even more involved in teaching the patient.

What incentives are being offered to recruit new nurses?

The Nurse Corps has always been an all volunteer corps. For 60 or so years we were an all female corps. During those years, we established our civilian recruiting contacts. We are not going through the same turmoil that the other corps are experiencing in recruiting. Educational opportunity is probably the number one reason given by a nurse who chooses the Nurse Corps. The opportunities we offered in the past for travel no longer seem to be the primary factor.

What is the general quality of the new nurse coming into the Navy?

The quality is outstanding. I am impressed and foresee rapid, professional advancement within the Nurse Corps.

Have educational opportunities increased or changed over the past three years. Are there new programs in education that weren't there before?

In overall numbers, our training billets have stayed about the same. Certain programs have changed. When I assumed this job our anesthesia program was very healthy. We had many more nurse anesthetists than we had billets for. Because of opportunities in the civilian community we've lost a number of our nurse anesthetists. We are therefore putting more emphasis and people into our anesthesia program now than we did three years ago.

Three years ago we were opening up and pushing our practitioner programs and now the numbers are climbing closer to our available billets all the time.

Now certain regulatory bodies require formal education in certain clinical specialties. They no longer consider on-the-job training sufficient to work in those specialty areas. This has required increased support for many short courses.

We have been forced to view our areas for performance beyond the four walls of a hospital.

I am convinced and will tell everyone that our nurses are probably the best teachers of any in the health field.

My successor will have the opportunity to work with the other federal nursing chiefs . . . on many emerging issues of national interest.

Back in '76 you said that retention was fairly stable. One problem of increasing concern has been the loss of trained professionals not just in the Navy but in the armed forces generally. We're losing doctors at an alarming rate. Are we losing nurses?

Our retention rate has been very good. In '77 and '78 it was about 60 percent for those completing their initial tour, which is extremely high for the Navy. I don't see a problem for the Nurse Corps at the present time.

In the health care field it is recognized that people are demanding to be kept well rather than waiting to be made well.

In the past few years there has been increased automation and the introduction of highly sophisticated equipment into naval medical facilities. Has this adversely affected the patient-nurse relationship?

It has increased the demand for more nurses. As an example, we have opened more neonatal intensive care units and have found the requirement is one nurse for every infant around the clock. When we open a 15-bed neonatal ICU we need anywhere from 45 to 47 nurses just to man that one clinical area. Our surgical ICU's, our medical ICU's and our coronary care facilities require many personnel. The ratio of nurse to patient has climbed dramatically.

When we think of automation, we often see it in terms of an automobile assembly line. You install more equipment and you take more people out of the picture. In this case the mere sophistication of the equipment requires more people.

Yes. And it requires much more than two hands. It requires in-depth knowledge as well as the sophistication of our equipment.

What is the Nurse Corps Quality Assurance Program?

We have to provide that the care we give the patient is effective and in his or her best interest. It must be measured and documented so that our training programs and procedures can be updated and improved. Now about 25 percent of the nurse's time is spent in documentation or complying with regulatory requirements. It must be remembered that nurses are not the only participants in quality assurance. This has become such a large area as to require a Quality Assurance Office at BUMED.

What has been done to update patient care planning systems?

We reviewed many of the forms that we were using at the patient care level and found that some commands had generated many forms to fulfill the demands for increased documentation. One command found the need to generate 47 different chits. We are trying to eliminate duplication wherever possible. A good example is the recording of a patient's vital signs. Vital signs are taken in the clinic or the emergency room, at the ward level, then taken again by the physician, and it goes on and on. We were duplicating much of the initial care; now we're trying to streamline wherever possible.

What challenges do you see for your immediate successor?

She will have a number of challenges. I believe there may well be a national health insurance program during her tenure. I don't think anyone yet knows what impact this will have on military medicine.

My successor will have the opportunity to work with the other federal nursing chiefs—the Army, Air Force, Public Health Service, and the Veterans Administration on many emerging issues of national interest.

Other possibilities exist. We recently had four Nurse Corps officers attend a course in cold weather training in the high mountains of Colorado. The opportunities for involvement in operational medicine are therefore becoming more common. The whole issue of "Readiness" will require monitoring and creative efforts.

There is tremendous talent, imagination, and drive within our nursing services. Everywhere I go I'm seeing new areas that we nurses are becoming involved in. The challenges for my successor and for Navy nurses in general are very exciting.

Adverse Health Effects of Smoking and the Occupational Environment

Medical Department personnel have long been aware of the health hazards associated with cigarette smoking and tobacco use. Less apparent, however, are the additional risks which attend smoking in specific work environments. The most recent example in the Navy community is the increased risk of lung cancer in workers who were exposed in the past to excessive concentrations of airborne asbestos fibers. The following is reproduced from *American Occupational Medicine Association Report,* March 1979:

"NIOSH recommends that the use of and/or carrying of tobacco products into the workplace be curtailed in situations where employees may be exposed to physical or chemical substances which can interact with tobacco products and that there be simultaneous control of worker exposure to physical and chemical agents. Six ways in which smoking can act in combination with hazardous agents in the workplace to produce or increase the severity of a wide range of adverse health effects have been identified. It should be noted that the six mechanisms are not mutually exclusive and several may prevail for any given agent. The six models of interaction follow:

• Certain toxic agents in tobacco products and/or smoke may also occur in the workplace, thus increasing exposure to the agent. For example, cigarette smoking causes increased exposure to carbon monoxide (CO). A CO concentration of 4% (40,000 ppm) in cigarette smoke can lead to a lung CO concentration of 0.04 to 0.05% (400 to 500 ppm), which can produce CO blood concentrations, as measured by the carboxyhemoglobin (COHb) level, of 3 to 10%.

• Workplace chemicals may be transformed into more harmful agents by smoking. Investigations of outbreaks of polymer fume fever provide a clear illustration of this effect. Other examples include a number of chlorinated hydrocarbons that have the potential for conversion to phosgene.

• Tobacco products may serve as vectors by becoming contaminated with toxic agents found in the workplace, thus facilitating entry of the agent into the body by inhalation, ingestion, and/or skin absorption. The effects of smoking cigarettes contaminated in the workplace with known amounts of tetrafluoroethylene polymer have been studied with the assistance of human volunteers. Nine out of ten subjects were reported to exhibit typical polymer fume fever symptoms after each had smoked just one cigarette contaminated with 0.40 mg tetrafluoroethylene polymer. Among other potential contaminants of tobacco products are boron trifluoride, carbaryl, and lead.

• Smoking may contribute to an effect comparable to that which can result from exposure to toxic agents found in the workplace, thus causing an additive biological effect. For example, combined worker exposure to chlorine and cigarette smoke can cause a more damaging biological effect than exposure to chlorine alone.

• Smoking may act synergistically with toxic agents found in the workplace to cause a much more profound effect than that anticipated simply from the separate influences of the occupational exposure and smoking. Asbestos provides one of the most dramatic examples of severe health damage resulting from interaction between the smoking of tobacco products and workplace exposures.

• Smoking may contribute to accidents in the workplace. In a nine-month study of job accidents, the total accident rate was more than twice as high among smokers as among nonsmokers. It has been suggested that injuries attributable to smoking were caused by loss of attention, preoccupation of the hand for smoking, irritation of the eyes, and cough."

It should be noted that eating or snacking in the workplace also may be dangerous because food, as well as tobacco, may serve as a vector when it becomes contaminated with toxic agents. Hand-washing and a little hygienic common sense can go a long way in reducing unnecessary exposures to work hazards among our active duty personnel and civilian employees.

BUMED Completes Reorganization

Moving offices, changing codes, and coping with disruption has never been popular in any organization. Most employees, when faced with such unpleasant prospects, are heard to exclaim, "Oh no, not another reorganization."

Well, reorganization is not a probability but an established fact at BUMED. Personnel and furniture have already been relocated, and an organizational manual and new telephone directory are soon to be released.

The new reorganization was not initiated on whim but based instead on a conscious decision to streamline and make BUMED more responsive to the Navy's health care needs.

In early 1978 the Surgeon General, with the support of the Assistant Secretary of the Navy for Manpower, Reserve Affairs, and Logistics, commissioned a study by an independent management consultant organization. The consultants analyzed all aspects of BUMED's operation—mission, goals, management philosophy, operating strategy, techniques, and controls. Although they identified many strengths, most notably in analytical, planning, and programming capability, they also found several deficiencies:

- BUMED frequently engaged in crisis management, reacting to situations rather than anticipating and planning for them.
- The Bureau's energies were frequently devoted to relatively routine internal administrative tasks.
- BUMED found it difficult to achieve internal coordination on matters ranging from routine administration to fundamental policy issues.
- Within BUMED and below the Surgeon General level, it was difficult to determine responsibility and accountability for support of BUMED programs.

Other problems existed, the key one being a diffusion or fragmentation of management responsibilities. Only the Surgeon General had the authority to rule on a broad spectrum of individual issues. Some delegation of authority existed but not enough to free the Surgeon General from many routine administrative decisions and allow him to concentrate on important policy matters. His involvement in almost every aspect of management resulted in the proliferation of numerous committees and special assistants.

In short, the study found the Bureau's operation to be topheavy, outdated, and inefficient.

Implementation

The Surgeon General's new role is specifically defined. He can now focus his attention on the resolution of major policy issues and have more time to maintain contacts with higher authority.

The Chief of Staff supervises a streamlined and effective staff.

The Deputy Surgeon General is delegated a more extensive role in the day-to-day direction of the headquarters operation.

The five existing codes have been consolidated into three major organizational units with defined responsibilities for planning, resource acquisition, professional development, and health care programs.

Well defined channels of communication have been established below the Surgeon General level. There are also definite points of contact for BUMED-managed activities.

Organizational Charts

The Surgeon General is supported by five key positions—the Deputy, a Chief of Staff, an Executive Assistant, the Inspector General, the Master Chief Petty Officer of the Force, and the Special Assistant for Research and Development.

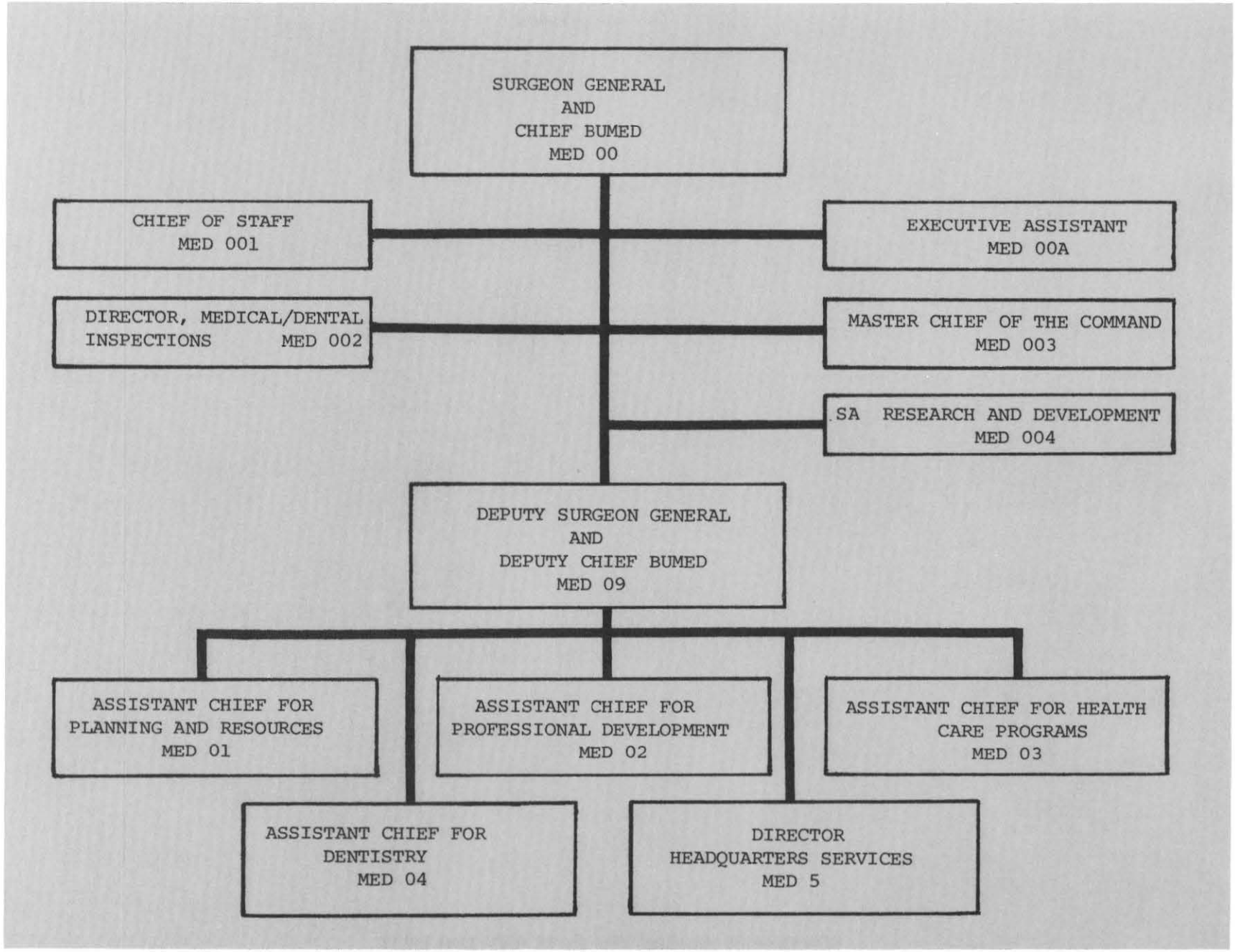
The Chief of Staff is a special advisor and assistant to the Surgeon General, coordinating all activities of the special assistants.

The Executive Assistant continues to handle administration and coordination of the Office of the Surgeon General.

The Deputy Surgeon General takes on responsibilities for day-to-day internal management of the headquarters operation. The Assistant Chiefs and Director of Headquarters Services report through the Deputy to the Surgeon General. The Dental Division and the Headquarters Services Division change only slightly. Organizationally, the three main Divisions change significantly.

Assistant Chief for Planning and Resources. This organization has five distinct organizational elements:

- Contingency Planning Division
- Resource Planning and Analysis Division
- Management Information Division
- Program/Budget Division; and
- Resource Execution Division


SURGEON GENERAL
AND
CHIEF BUMED
MED 00
CHIEF OF STAFF
MED 001
EXECUTIVE ASSISTANT
MED 00A
DIRECTOR, MEDICAL/DENTAL
INSPECTIONS MED 002
MASTER CHIEF OF THE COMMAND
MED 003
SA RESEARCH AND DEVELOPMENT
MED 004
DEPUTY SURGEON GENERAL
AND
DEPUTY CHIEF BUMED
MED 09
ASSISTANT CHIEF FOR
PLANNING AND RESOURCES
MED 01
ASSISTANT CHIEF FOR
PROFESSIONAL DEVELOPMENT
MED 02
ASSISTANT CHIEF FOR HEALTH
CARE PROGRAMS
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HEADQUARTERS SERVICES
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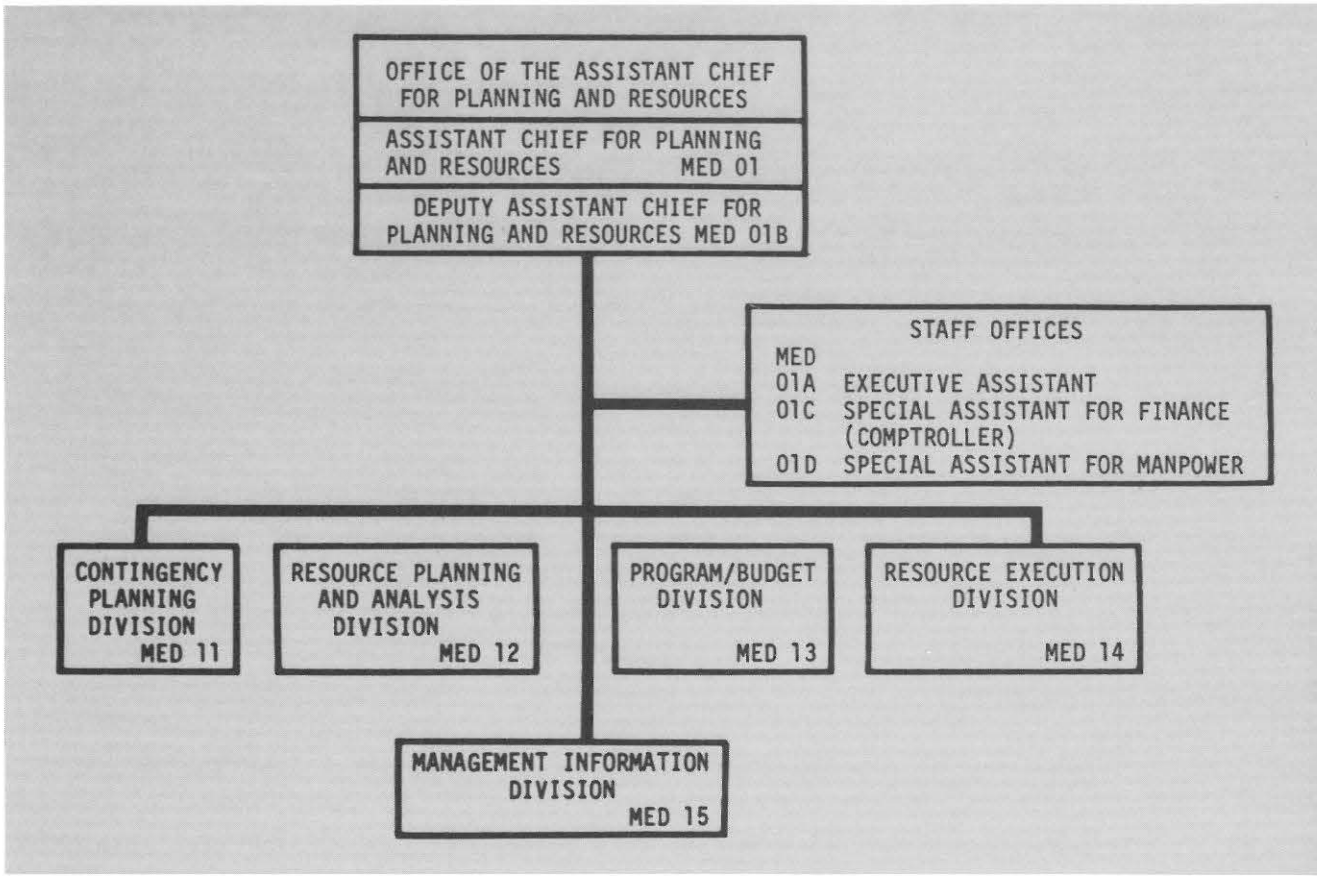
TEAR OUT AND SAVE FOR FUTURE REFERENCE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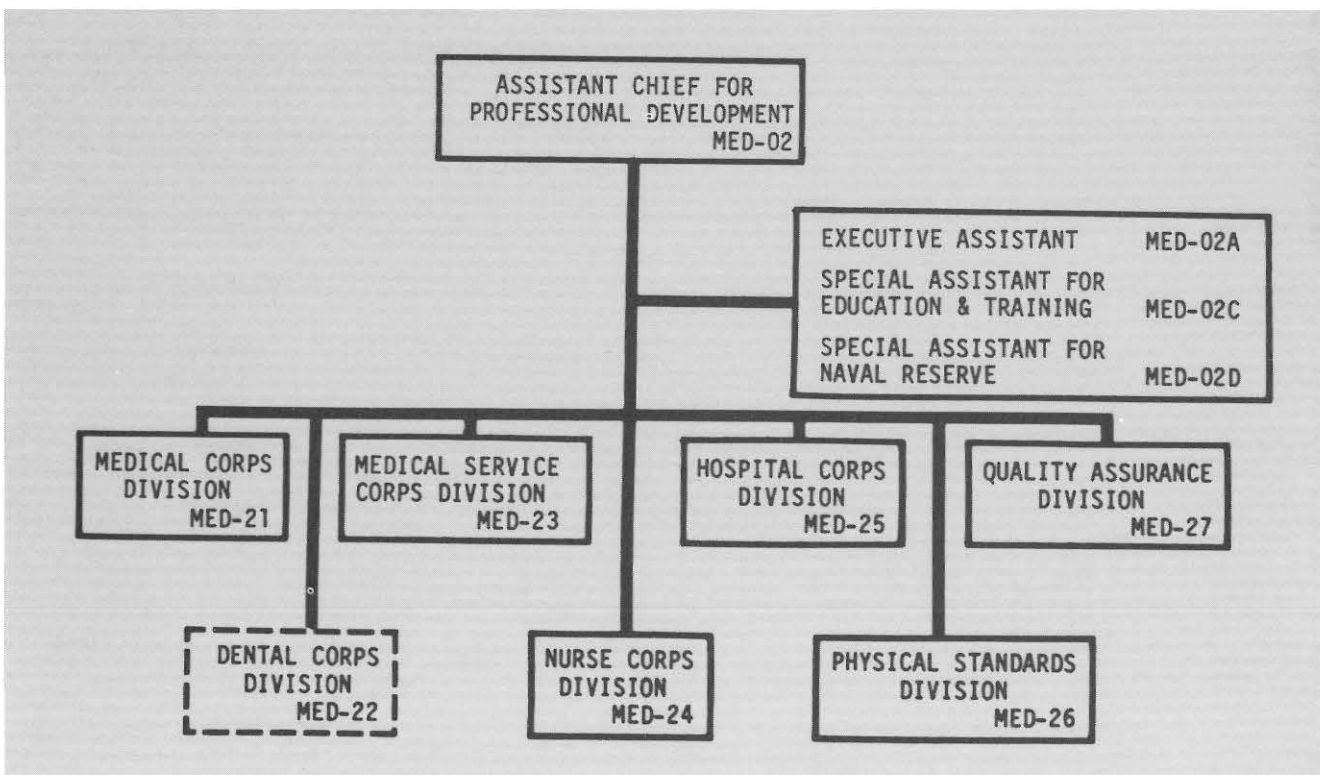
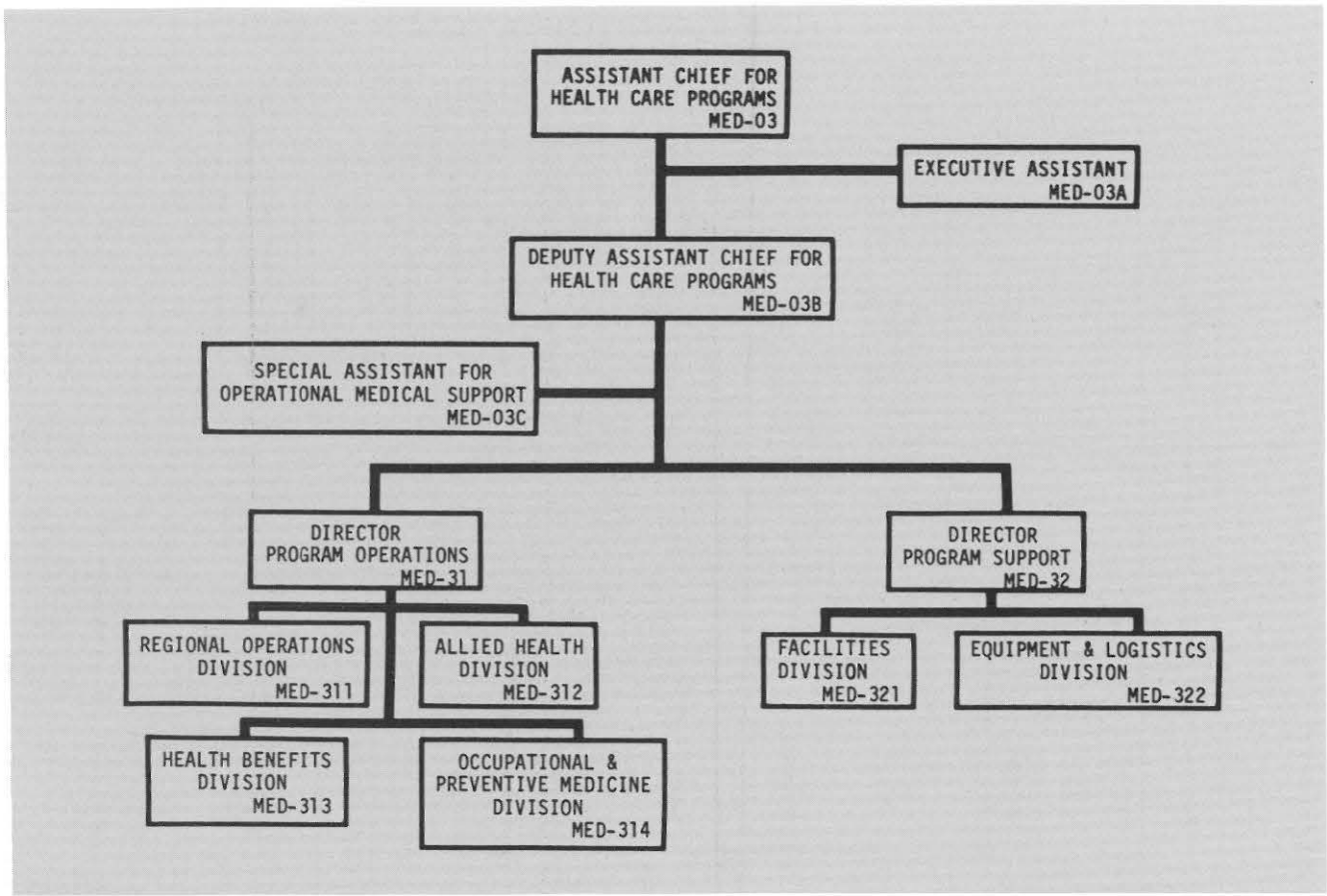
DEPUTY ASSISTANT CHIEF FOR PLANNING AND RESOURCES MED 01B
STAFF OFFICES
MED
01A EXECUTIVE ASSISTANT
01C SPECIAL ASSISTANT FOR FINANCE (COMPTROLLER)
01D SPECIAL ASSISTANT FOR MANPOWER
CONTINGENCY PLANNING DIVISION MED 11
RESOURCE PLANNING AND ANALYSIS DIVISION MED 12
PROGRAM/BUDGET DIVISION MED 13
RESOURCE EXECUTION DIVISION MED 14
MANAGEMENT INFORMATION DIVISION MED 15


ASSISTANT CHIEF FOR PROFESSIONAL DEVELOPMENT MED-02
EXECUTIVE ASSISTANT MED-02A
SPECIAL ASSISTANT FOR EDUCATION & TRAINING MED-02C
SPECIAL ASSISTANT FOR NAVAL RESERVE MED-02D
MEDICAL CORPS DIVISION MED-21
MEDICAL SERVICE CORPS DIVISION MED-23
HOSPITAL CORPS DIVISION MED-25
QUALITY ASSURANCE DIVISION MED-27
DENTAL CORPS DIVISION MED-22
NURSE CORPS DIVISION MED-24
PHYSICAL STANDARDS DIVISION MED-26

TEAR OUT AND SAVE FOR FUTURE REFERENCE



In addition, the Assistant Chief for Planning and Resources is aided by special assistants for manpower and finance.

Assistant Chief for Professional Development. This organization is responsible for the recruitment, professional development, and retention of personnel, as well as the development of professional standards and standards of care.

In addition to the five corps divisions, there are the Physical Standards Division and the new Quality Assurance Division.

The Assistant Chief for Professional Development is also assisted by a Special Assistant for Education and Training—the Commanding Officer, Health Sciences Education and Training Command, and a Special Assistant for Naval Reserve.

The Dental Corps is represented through a collateral or additional duty assignment.

The Corps Division take a leading role in the development of professional standards and programs designed to increase the quality of services delivered. In this regard, the Corps Divisions review the qualifications, mix, and use of personnel.

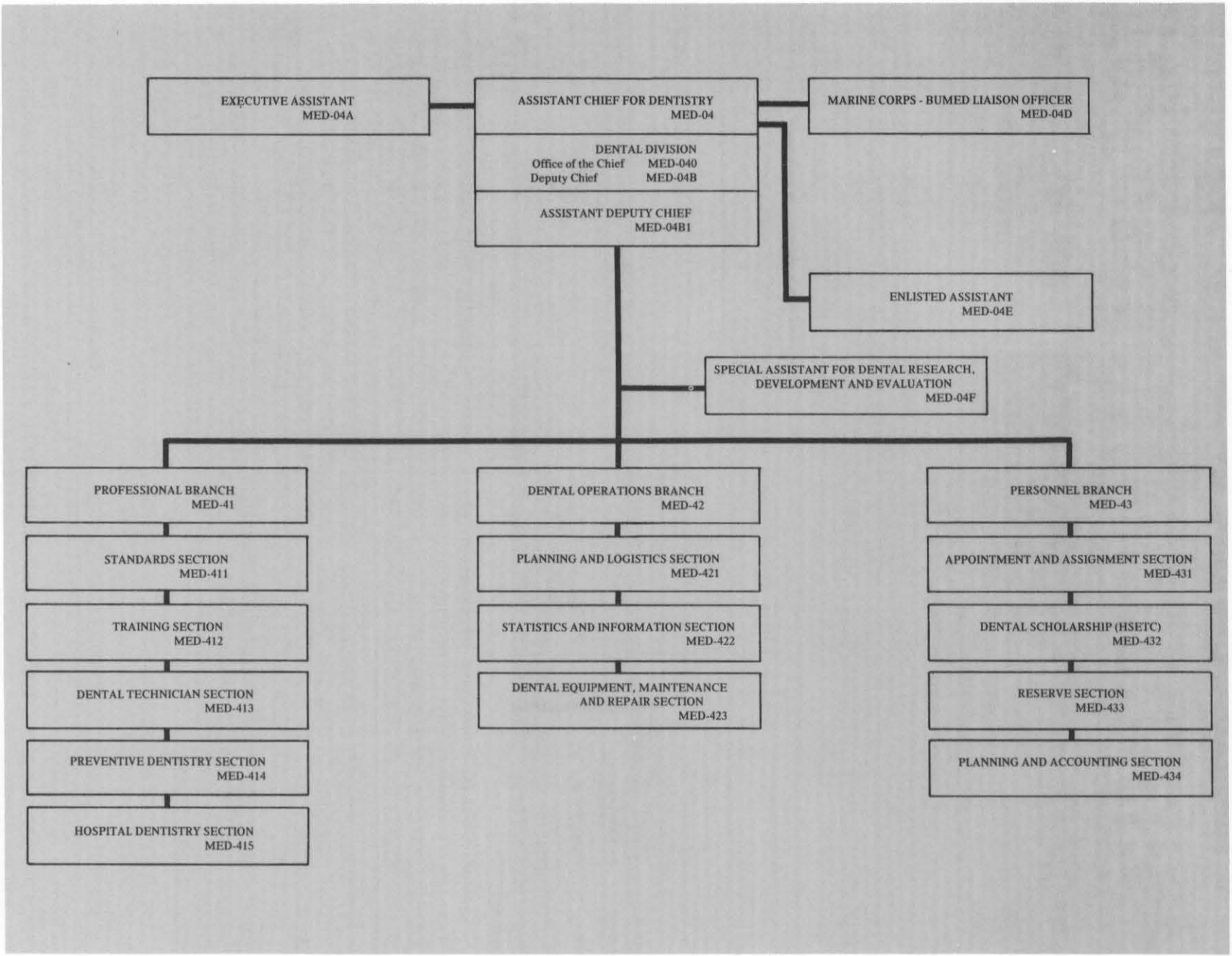
The Quality Assurance Division is responsible for developing standards for health care delivery and for monitoring care delivery.

Assistant Chief for Health Care Programs. This office directs all operational and clinical medicine programs. It consolidates program management activities and permits integrated review and management of the resource mix. It provides support and direction to BUMED-managed activities. The Assistant Chief for Health Care Programs is the Program Manager and advocate for the field within BUMED.

The organization is divided into three basic elements. The Director, Program Operations, coordinates support and monitors the health care delivery mechanism. The Regional Operations Division is the day-to-day link with all BUMED-managed activities.

The Director, Program Support, identifies program requirements for facilities, equipment, and logistics.

The above charts should serve to illustrate the new BUMED organizational structure. What should be evident is its relative simplicity. It is hoped that reorganization will solve many of the old problems and bring a high level of efficiency to the Navy's entire health care system.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ASSISTANT CHIEF FOR DENTISTRY
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MARINE CORPS - BUMED LIAISON OFFICER
MED-04D
DENTAL DIVISION
Office of the Chief MED-040
Deputy Chief MED-04B
ASSISTANT DEPUTY CHIEF
MED-04B1
ENLISTED ASSISTANT
MED-04E
SPECIAL ASSISTANT FOR DENTAL RESEARCH, DEVELOPMENT AND EVALUATION
MED-04F
PROFESSIONAL BRANCH
MED-41
STANDARDS SECTION
MED-411
TRAINING SECTION
MED-412
DENTAL TECHNICIAN SECTION
MED-413
PREVENTIVE DENTISTRY SECTION
MED-414
HOSPITAL DENTISTRY SECTION
MED-415
DENTAL OPERATIONS BRANCH
MED-42
PLANNING AND LOGISTICS SECTION
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STATISTICS AND INFORMATION SECTION
MED-422
DENTAL EQUIPMENT, MAINTENANCE AND REPAIR SECTION
MED-423
PERSONNEL BRANCH
MED-43
APPOINTMENT AND ASSIGNMENT SECTION
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DENTAL SCHOLARSHIP (HSETC)
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RESERVE SECTION
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PLANNING AND ACCOUNTING SECTION
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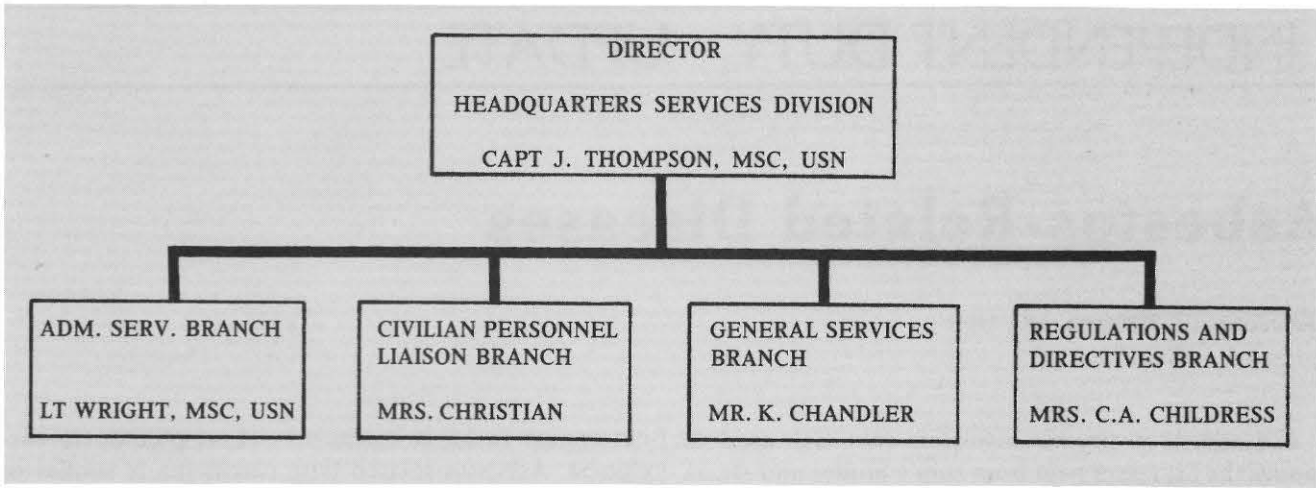


Organization and Reorganization of BUMED

1842 BUMED established by act of Congress

1910 Office of the Surgeon General becomes a full-time position

1946 BUMED reestablished into six components:
- Surgeon General and Chief of the Bureau
- Deputy Surgeon General and Assistant Chief of the Bureau
- Assistant Chief for Professional and Personnel Operations
- Assistant Chief for Planning and Logistics
- Assistant Chief for Dentistry
- Assistant Chief for Aviation Medicine and Medical Military Specialties; in 1947 this was changed to the Assistant Chief for Aviation and Operational Medicine and Assistant Chief for Research and Military Medical Specialties

1974 BUMED reorganization and addition of:
- Naval Medical Research and Development Command and Health Sciences Education and Training Command
- Special Assistants for Automated Data Processing, Education and Training, and Medical Research and Development
- Corps Directorate

The essential elements of the present BUMED Headquarters structure were created:
- The Operational Medical Support organization grew out of the Aviation Medicine and Medical Specialties functions
- Planning and Logistics became the Office of Program Planning and Analysis and a separate Materiel Resources Organization
- Establishment of a Regional Health Care Administration

1977 An internal study proposed major changes in this organization framework; study was not implemented

1978 Independent study commissioned by private consultant and findings implemented 16 April 1979

Asbestos-Related Diseases

CDR Joseph J. Bellanca, MC, USN

Asbestos is a fibrous insulation material used to control the escape of heat from ship's broiler and steam pipe systems. When airborne asbestos fibers are inhaled in significant amounts, serious diseases and death may result. These diseases, asbestosis and cancer, often do not become apparent for 20 or more years after the beginning exposure. Protective measures designed to keep down the risk of asbestos exposure in the Navy include: dust control, use of respiratory protective equipment, a medical surveillance program of personnel potentially exposed to asbestos.

Asbestosis is a gradual fibrosis of the lungs which causes shortness of breath and eventually heart failure. It occurs in workers with heavy exposure to airborne asbestos dust. Most asbestosis now seen in workers began with heavy exposure 10 or more years ago.

Early asbestosis is identified on chest X-rays as increased interstitial densities which are most evident in the lower lung zone. Small irregular and linear opacities may appear as the disease progresses. The cardiac and diaphragmatic outlines become less sharply defined.

Pleural changes are an early sign of asbestos exposure and are not associated with symptoms or disability. Pleural plaques, sometimes calcified, may be seen on the chest X-ray as distinct nodular densities at the edge of the lung fields. Pleural thickening appears as decreased sharpness between the lung and the inner chest wall, usually located in the lower and middle portions of the lungs bilaterally. When calcified, they have a bizarre holly-leaf or lace-like appearance.

Pulmonary carcinoma is an important problem in former workers who have had heavy asbestos exposure *and who smoke.* Studies of heavily exposed workers indicate that lung cancer incidence increases with the degree of asbestosis. Nonsmoking asbestos workers do not appear to be at increased risk of pulmonary carcinoma. Asbestos-related lung carcinoma is similar to other lung carcinoma. Symptoms include cough, chest pain, hemoptysis, and weight loss. The diagnosis is confirmed by chest X-ray or other usual diagnostic methods.

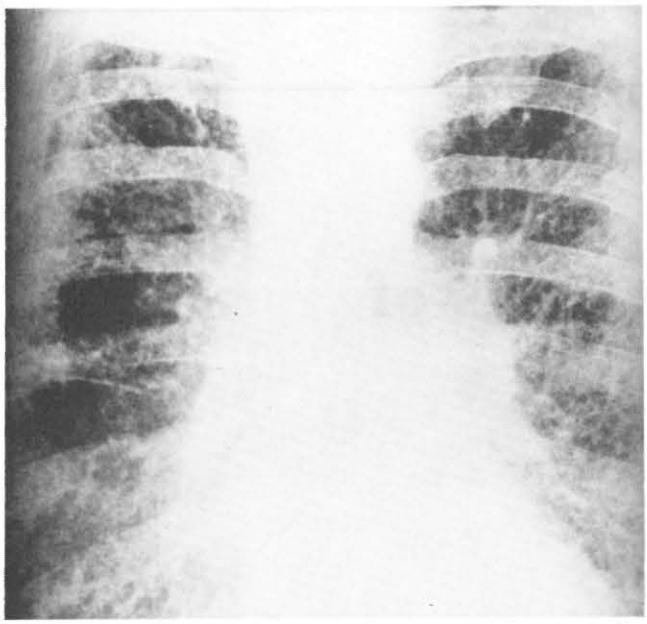
Mesothelioma is a rapidly fatal malignant cancer of the lining of the chest or the peritoneal cavity. In the chest, the first symptoms are usually pain and progressive shortness of breath. Chest X-rays show pleural effusion, irregular pleural thickening, or mass shadows. Peritoneal mesothelioma causes pain, weight loss, and ascites. Mesothelioma is rarely curable when discovered.

In managing workers with exposure to airborne asbestos, certain points should be emphasized:

- *Occupational exposure history.* A detailed lifetime history should be obtained. This is time consuming but important because significant exposures may have been brief and have occurred years ago.
- *Clinical findings.* A detailed history for symptoms of shortness of breath on exertion, chest X-rays, and pulmonary function tests are important for early diagnosis. Early X-ray changes are subtle; X-rays must be reviewed carefully by experienced "B" readers who have been trained to interpret X-rays for pulmonary dust disease. Such readings should include a thorough search for pleural changes, the earliest sign of asbestos exposure.
- *Emphasis on preventive measures.* Large multicenter studies sponsored by the National Cancer Institute show that early detection of lung cancer by present medical screening techniques is not effective in reducing mortality due to lung cancer. Therefore, the most effective measures for the prevention of all asbestos-related diseases are cessation of cigarette smoking and avoidance of exposure to airborne asbestos. Cessation of smoking significantly diminishes the risk of lung cancer in workers exposed to asbestos.

Since smoking is a deeply ingrained habit, dire

From the Department of the Navy, Bureau of Medicine and Surgery (Code 3142), Washington, D.C. 20372.

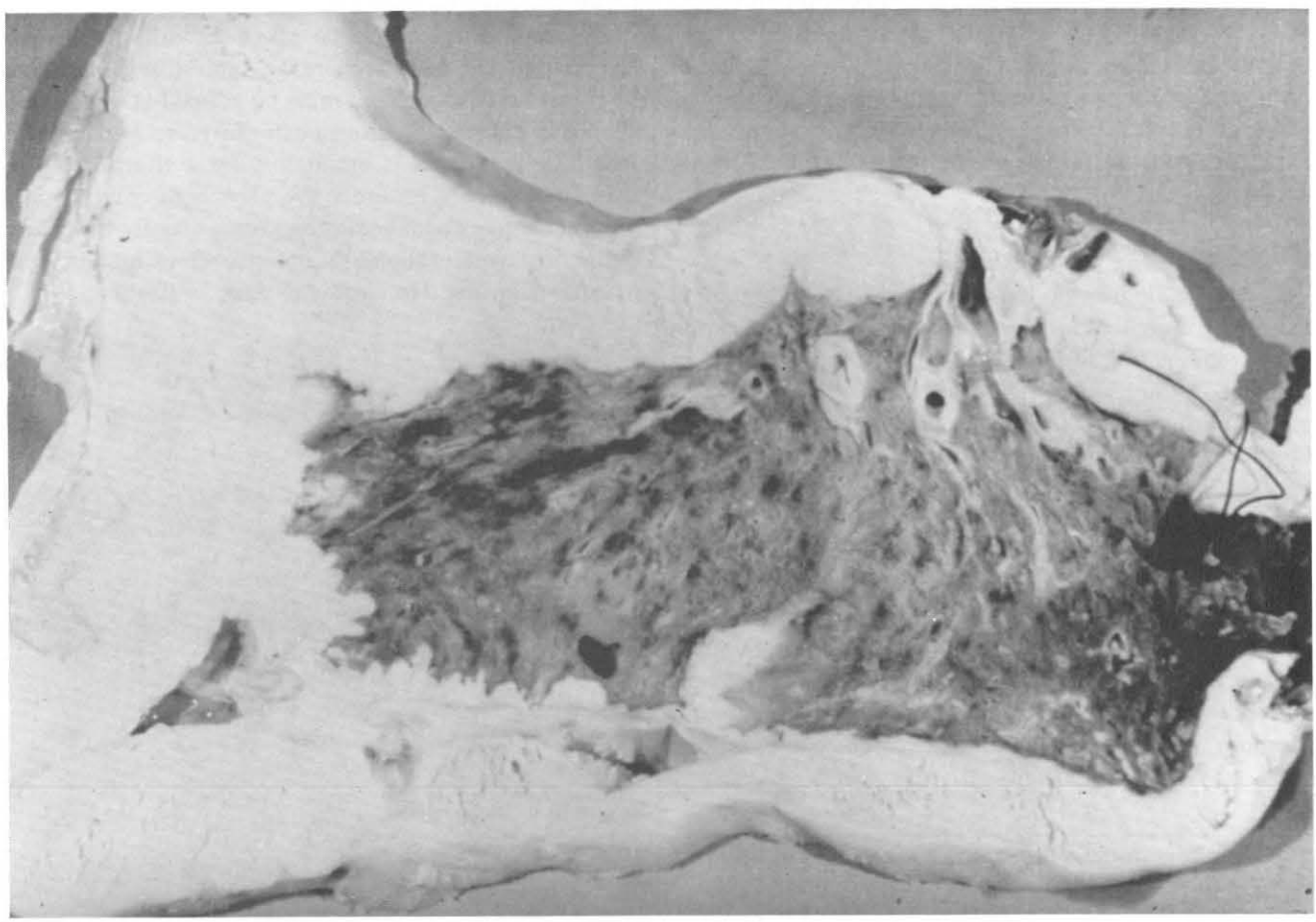


Chest film exhibiting advanced asbestosis with fine irregular opacities in all lung zones, particularly in the lower zones. The cardiac outlined is ill-defined.

warnings about the danger are rarely helpful. Few people appreciate an intellectualized scolding lecture, and studies have been demonstrated that the "scare" approach is ineffective. In fact, the smoker's everyday experience contradicts the statistical evidence about the dangers of smoking. Most people recognize that the great majority of smokers do not die of lung cancer or other diseases at a noticeably early age. Statistics may not be "significant" to the individual.

Although there are no absolute laws of human behavior, a friendly encouraging approach is often helpful. Support plus "how to" suggestions lead to successful interventions. Handouts available from voluntary health organizations provide a wide variety of useful techniques.

Current Navy policy concerning asbestos exposure is defined in OPNAV 6260.1A. Medical personnel should emphasize the importance of proper asbestos work procedures and the use of respiratory protection. The risk of asbestos exposure in the workplace can be minimized if each Medical Department representative contributes enthusiastically to the effort.



Autopsied lung encapsulated and compressed by a thick malignant mesothelioma

Roentgenographic Findings of Asbestos Exposure

CAPT John P. Smith, MC, USN
CAPT Charles W. Ochs, MC, USN (Ret.)

The hazards of asbestos have recently been brought to public attention by the press and television. The Navy has particularly been subject to criticism for its previous widespread use of this substance and for failing to detect its effects in military personnel and shipyard workers. Early changes of asbestos exposure usually cannot be detected by physical examination or pulmonary function tests. However, there are certain findings in routine chest radiography which may indicate this exposure. These are reviewed in the following section.

Technique

Proper radiographic technique for the detection of asbestos-related change requires optimal visualization of both the pleura and the interstitial lung markings. In general, a high kV, wide latitude technique which allows faint visualization of the first five or six thoracic vertebrae behind the heart is ideal. This allows a tolerance for error and produces consistent film quality with less radiation to the patient. The kV should be in the range of 120 to 140, with an exposure time of 1/30 second or less. Three-phase equipment is preferred.

Film and screen speed vary with size of the grain or crystal. An inverse relationship holds for resolution. As motion also degrades the quality of the image, a compromise between resolution and speed must be made. Medium (par) speed film and screen combinations produce the most satisfactory results. The increased scatter radiation produced by the high kV technique requires a high resolution 103 line per inch, 10:1 fixed grid focused at 72 inches. Alternatively, an air gap technique may be employed.(*1*)

The radiograph must be taken in full inspiration. Expiration will falsely increase interstitial markings. The top of the diaphragm must be at least at the level of the sixth anterior or ninth posterior ribs. A 1.2 mm or less tube focal spot is mandatory for a sharp image.

Normally, only an erect PA view is needed. As the pleural changes of asbestos exposure usually first occur in the posterolateral pleura, oblique views may be used in equivocal cases to show this area in profile.

TABLE 1. Characteristics of Asbestos-Related Pleural Thickening

1. Mid-thoracic region of the lateral parietal pleura with anterior and posterior extension.
2. Spares apex, costophrenic angle.
3. Bilateral: flat or nodular masses (plaques). En face, vague haziness.
4. Slowly progressive: years to detect change.
5. Calcification, late.
6. Pulmonary fibrosis uncommon.
7. Asymptomatic. Pulmonary function usually normal: mild compliance loss.

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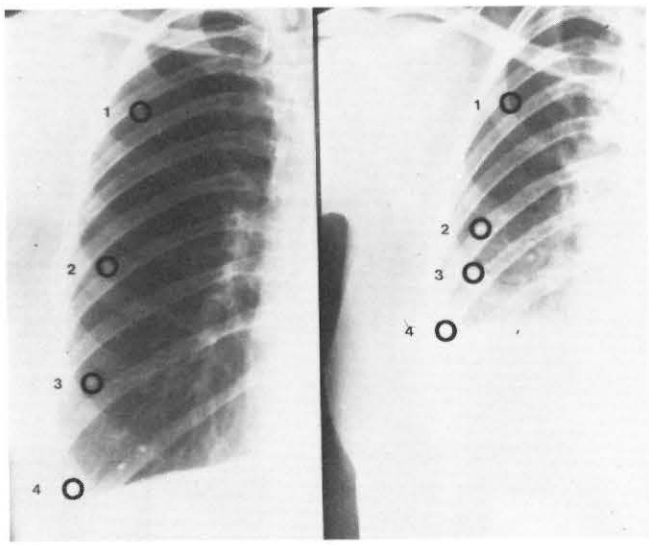

FIGURE 1. Films in inspiration and expiration. The encircled calcifications demonstrate that maximum excursion between the pleural surfaces occurs at the mid-thoracic region.

Incidence

Extensive roentgenographic and autopsy studies on British shipyard workers (*2*) and the general population of London and Copenhagen (*3,4*) suggest that only 10 to 15% of the pleural plaques present at autopsy are seen radiographically.(*5*) While pulmonary parenchymal asbestosis is relatively uncommon in active duty or retired Navy personnel, pleural thickening or plaques are seen roentgenographically in about 5% of those over age 50.(*6*) Both changes progress slowly; three years is usually needed before a significant increase can be detected.

Typically, a 15- to 20-year latent period exists between the initial exposure and appearance of radiographic findings. Pleural plaques may be the result of a single short-term exposure many years in the past.(*7*)

Radiographic Findings

Pleural Plaques. Pleural plaques are a hallmark of asbestos exposure. They are the most common asbestos related findings in Navy personnel and shipyard workers (Table 1). While they can be produced by mica, fiberglass, carborundum, graphite, aluminum silicate, and diatomaceous earth, asbestos is by far the most common cause.(*6,8*)

The normal pleura above the level of the fourth rib can be up to 5 mm thick on the PA view and up to 10 mm thick on the oblique view. Below the fourth rib it should be a thin line less than 1 mm.(*8*) Pleural plaques due to asbestos are most commonly seen on the posterior lateral aspect of the chest wall between ribs five and nine,(*6*) as this is where the excursions between the parietal and visceral pleura are greater (Figure 1). The plaques are located exclusively on the parietal pleura, are sharply marginated and irregular. Microscopically, they consist of subpleural dense hyaline connective tissue. It is postulated that inhaled fibers migrate through the visceral pleura and irritate the parietal pleura during respiration.(*6*)

A confluence of plaques is responsible for the roentgenographic pleural change. Early there is a slight thickening of the pleural stripe adjacent to a rib. The rib is thus separated from the lung by a small area of water density (Figure 2). Later the plaques become oval with tapering superior and inferior margins characteristic of an extrapleural lesion (*8*) (Figures 3 and 4). Plaques on the chest wall are usually seen radiographically before those on the diaphragm; however, diaphragmatic calcifications are easier to identify. En face this thickening appears as a vague haziness and oblique tangential views are needed to demonstrate the pleural origin. Calcification occurs 20-30 years after exposure and produces a dense dot-dash or continuous line when seen in profile. En face, sharply angular lines of calcification appear.

Pleural thickening is a reliable sign of asbestos exposure only if bilateral with sparing of the apices and costophrenic angles. Otherwise, the finding becomes

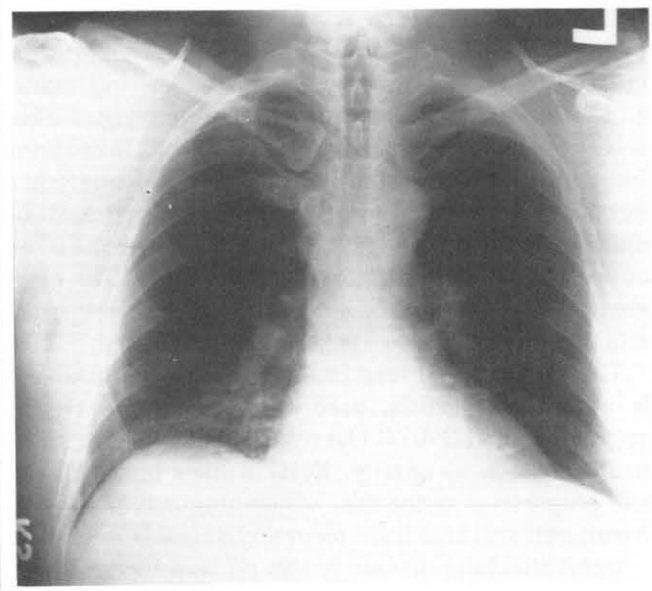

FIGURE 2. Early plaque formation. The fifth-ninth ribs are separated from the air-filled lung by a small area of water density.

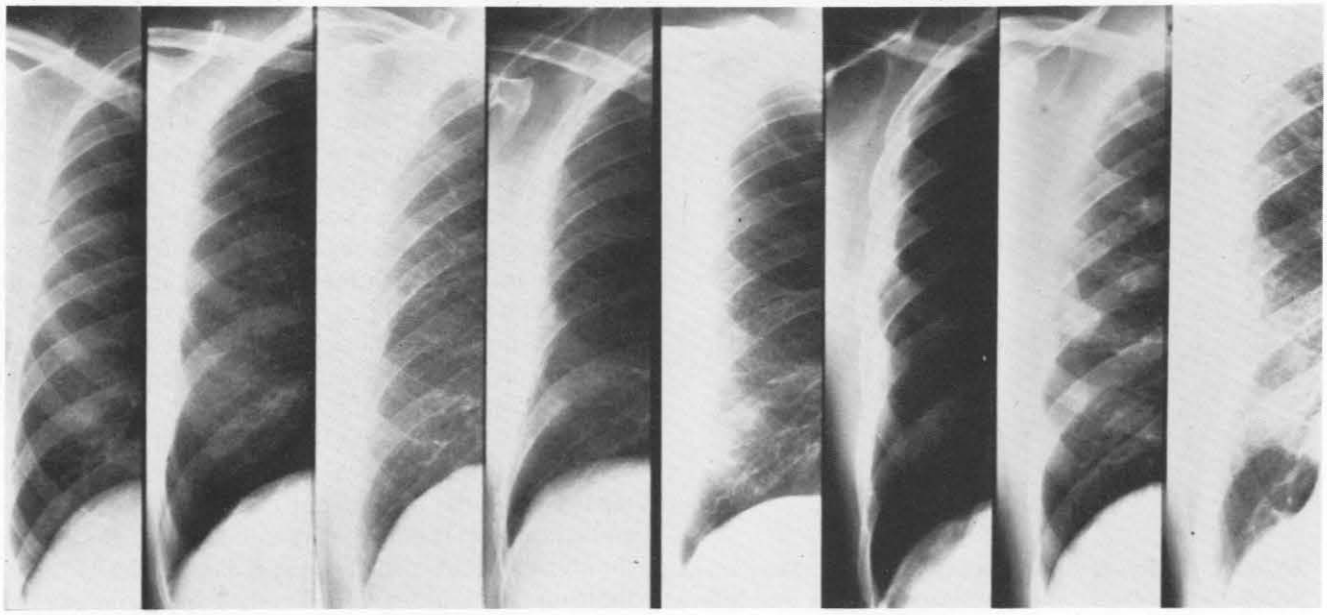

FIGURE 3. Spectrum of plaque formation from normal to extensive. Note the tapering margins of an extrapleural lesion as the thickness increases.

nonspecific and is likely the result of previous trauma or inflammation. (*6*)

Diffuse Pleural Thickening. This is considerably less frequent than plaque formation. It is initially seen in the basilar regions where it presents as an ill-defined diaphragm. Later, pericardial adhesions, thickened interlobar septa, and occasionally thickening of the entire pleural surface occur.(*9,10*) Unlike pleural plaques, this may be associated with pulmonary function abnormalities. (*11*)

Pleural Effusion. Most pleural effusions seen in the course of asbestosis are related to underlying malignancy.(*9*) Benign pleural effusion is a relatively rare but distinct entity which is being reported with increasing frequency. The effusion is an exudate and interstitial fibrosis is present in the underlying lung. It may be unilateral or bilateral, undergo spontaneous resolution, or progress to diffuse pleural thickening.(*10*) The diagnosis should be entertained only after mesothelioma, other malignancy, and TB have been excluded.

The parenchymal lung change of asbestos exposure is interstitial fibrosis, predominantly in the basilar areas. In the ILO U/C classification this is the small irregular (s, t, u) opacity. Kerly B lines may be seen and progression to the honeycomb lung may occur.(*12*) About half will also have pleural changes.(*10*)

Interstitial lung disease is also nonspecific and difficult to diagnose by radiographic means in the early stages. Slight variations in radiographic technique can obscure or give false positive findings. Detection of minimal disease is often subjective; however, the presence of Kerly B lines are an objective finding indicative of an abnormality in the lung interstitium. Other objective criteria have been suggested based upon the appearance of perivascular fibrosis. These include increased visibility of normal lung markings,

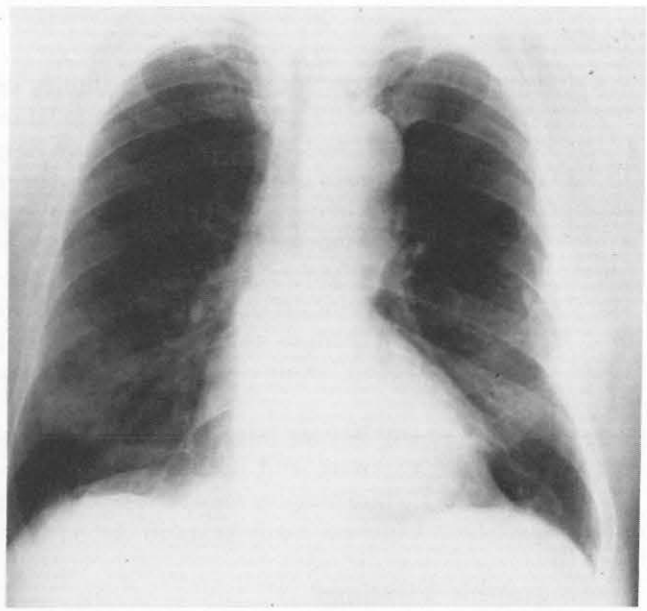

FIGURE 4. Extensive bilateral plaque formation. The costophrenic angles and apices are spared. The vague haziness over the lower lung fields is caused by en face plaques.

thickening of small vessels at points of branching, visibility of vessels to the pleural surface, and nodularity along these vessels.(*9*)

The pulmonary parenchymal changes of asbestosis may progress in spite of the removal of exposure. There is evidence that an autoimmune process causes progression after initiation by the asbestos fibers.(*12*)

Discussion and Summary

Low level exposure to asbestos, such as Navy personnel are likely to encounter, produces pleural change earlier and more frequently than parenchymal change. The term "asbestosis" should be reserved for parenchymal lung disease. The appearance of bilateral pleural thickening with sparing of the apices and costophrenic angles should alert one to the possibility of previous asbestos exposure. While pleural plaques alone are not associated with significant pulmonary function abnormalities, the asbestos exposure they indicate may put the patient at higher risk for the development of lung carcinoma or mesothelioma. It is known that asbestos is a strong potentiator of cigarette smoking in the production of bronchogenic carcinoma. These personnel, therefore, should stop smoking.

In summary, pleural plaque formation is the most frequent change likely to be encountered in Navy personnel and should alert the physician to the possibility of previous asbestos exposure.

References

1. Sargent EN: *A Home Study Syllabus on Technics for Chest Radiography.* American College of Radiology, pp 5-12, 1973.
2. Harries PG, MacKenzie FAF, Sheers G, Kemp JH, Oliver TP, Wright DS: Radiologic Survey of Men Exposed to Asbestos in Naval Dockyards. *Brit J Industr Med* 29:274-279, 1972.
3. Hourihane D, Lessof L, Richardson PC: Hyaline and Calcified Pleural Plaques as an Index of Exposure to Asbestos. Features of 100 Cases with a Consideration of Epidemiology. *Brit Med J* 1:1069-1074, April 30, 1966.
4. Francis D, Jussuf T, Mortensen B, Sikjer B, Viskum K: Hyaline Pleural Plaques and Asbestos Bodies in 198 Randomized Autopsies. *Scan J Resp Dis* 58:193-196, 1977.
5. Thompson JG: Pathogenesis of Pleural Plaques. International Conference on Pneumoconiosis, Johannesburg, April 23-May 2, 1969.
6. Ochs CW, Smith JP: Chronic Pleural Thickening: Some Observations on Cause and Pathogenesis. *Milit Med* 141:77-81, Feb 1976.
7. Kiviluoto R: Pleural Plaques and Asbestos: Further Observations on Endemic and Other Non-Occupational Asbestosis. *Ann NY Acad Sci* 132:235-239, 1966.
8. Sargent EN, Jacobson G, Gordonson JS: Pleural Plaques: A Signpost of Asbestos Dust Inhalation. *Seminars in Roentgenology,* XII(4):287-297, Oct 1977.
9. Fletcher DE, Edge JR: The Early Radiological Changes in Pulmonary and Pleural Asbestosis. *Clin Rad* 21:355-365, 1970.
10. Becklake MR: Asbestos Related Diseases of the Lung and Other Organs: Their Epidemiology and Implications for Clinical Practice. *Am Rev Resp Dis* 114:187-227, 1976.
11. Lumley KP: Physiological Changes in Asbestos Pleural Disease. *Inhaled Part 4 Pt.* 2:781-788, Sept 1975.
12. Turner-Warwick M: A Perspective View on Widespread Pulmonary Fibrosis. *Brit Med J* 2:371-376, May 18, 1974.

WIC Program in Operation

The purpose of the WIC (Women, Infants and Children's Special Supplemental Food Program) as stated in the Child Nutrition Act of 1975 (Public Law 94-105) is ". . . to provide supplemental nutritious foods as an adjunct to good health care during such critical times of growth and development in order to prevent the occurrence of health problems."

In conjunction with the State of North Carolina and the Craven County Health Department, a WIC office was established at the Naval Hospital, Cherry Point, in March 1979. The WIC program has authorized a case load of 500 patients to be followed jointly by the naval hospital staff and the WIC nutritionist assigned to the hospital. Generally, the WIC program is aimed at prevention of health problems by improving pregnancy outcome and by attaining satisfactory growth and development of infants (birth to 1 year of age) and children (1 year to 5 years of age) through improved nutrition.

The program involves screening and referral of patients with nutritional risk to the WIC nutritionist for evaluation against the program's certification criteria. If eligible within the WIC guidelines, the patient is provided nutritionally supplemental foods through the WIC funding process. The patient is evaluated each month by the WIC nutritionist who also provides nutritional counseling. At the end of six months a determination is made to continue or discontinue in the WIC program based on the nutritional risk still involved.

The WIC program at Naval Hospital, Cherry Point, is integrated with all services, but mainly with family practice, pediatrics, and obstetrics/gynecology. Additional information about the program is available from the CO, Naval Hospital, Cherry Point, N.C. 28533.

Sampling for Airborne Asbestos Fibers

LTJG Kenneth R. Still, MSC, USNR
Roger R. Beckett

Asbestos is a generic name applied to a number of naturally occurring mineral silicates differing in chemical composition. Although there are numerous types of asbestos minerals, chrysotile, a hydrated magnesium silicate, is the most widely used, comprising approximately 95% of the world asbestos production.(*1,6*) Chrysotile, along with quantities of amosite, was installed for many years on Navy ships and in shore activities.(*1*) Commercially, there are approximately 3,000 different products containing asbestos; however, major uses are in bonded products (building siding, water pipe, brake and clutch linings), fireproofing materials (asbestos board), high temperature insulation, asbestos cloth, gasket materials, vinyl asbestos flooring, and others.(*2*) Current research is producing numerous asbestos-free substitutes, many of which are being utilized in modern day Navy ships. However, older vessels often contain original asbestos insulation which releases airborne fibers during removal.(*1,3,4*) Other tasks which can generate asbestos dust include power sawing of asbestos-containing fire retardant material, and brake relining and repair. These operations can generate concentrations of airborne asbestos which exceed permissible safe limits for personnel not properly protected.

The current Occupational Safety and Health Administration Time Weighted Average for asbestos exposure is 2.0 fibers longer than five micrometers per cubic centimeter of air.(*5*) This value is the maximum 8-hour airborne concentration of asbestos fibers to which unprotected personnel may be exposed. Proposed changes to OPNAVINST 6260.1 may lower exposure standards to 0.5 fibers longer than five micrometers per cubic centimeter of air. The ceiling limit for exposure is not to exceed 10 fibers longer than five micrometers per cubic centimeter of air, at any time. Inhalation of excessive quantities of asbestos fibers over a prolonged period of time may produce several documented health hazards, notably asbestosis, bronchogenic carcinoma, and malignant mesothelioma of the pleura and peritoneum.(*2,3,4,7*) Because of the potential imminent health hazards associated with elevated asbestos fiber concentrations, a sound, functional sampling program of jobs involving asbestos-containing materials must be undertaken before, during, and after job completion.

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Sampling Strategy

Sampling programs are designed and implemented for a variety of reasons. A major function of the industrial hygienist is to recognize, evaluate, and control health hazards in the industrial environment which may potentially affect the health of work force personnel. Environmental and personal sampling is one way to detect and evaluate potential workplace hazards. The major purpose for establishing a sampling program is to determine the level of worker exposure to occupational hazards so that, if necessary, health protective measures can be instituted. There are, however, several corollary reasons for sampling: determination of exposure for new processes or changes in established processes; determination of exposure resulting from a change in material usage; testing the effectiveness of installed engineering controls; research purposes for sundry reasons; and, determination for justification of worker grievances regarding potentially hazardous material exposure.

Superficially, the concept of sampling appears to be quite simple. However, delicate details of a good sampling and/or monitoring program may be misunderstood unless the person undertaking the work is adequately trained and under the direct technical supervision of a professional industrial hygienist. Without guidance from an industrial hygienist, erroneous application of techniques, techniques lacking quality control, unawareness of malfunctioning instruments, improper usage of instruments, and data misinterpretation are common. Proper selection of a suitable sampling subject and techniques which yield reproducible results are major problems encountered in establishing a sampling program. These problem areas can be overcome by meticulous planning prior to undertaking any sampling program. The basic framework for a good airborne

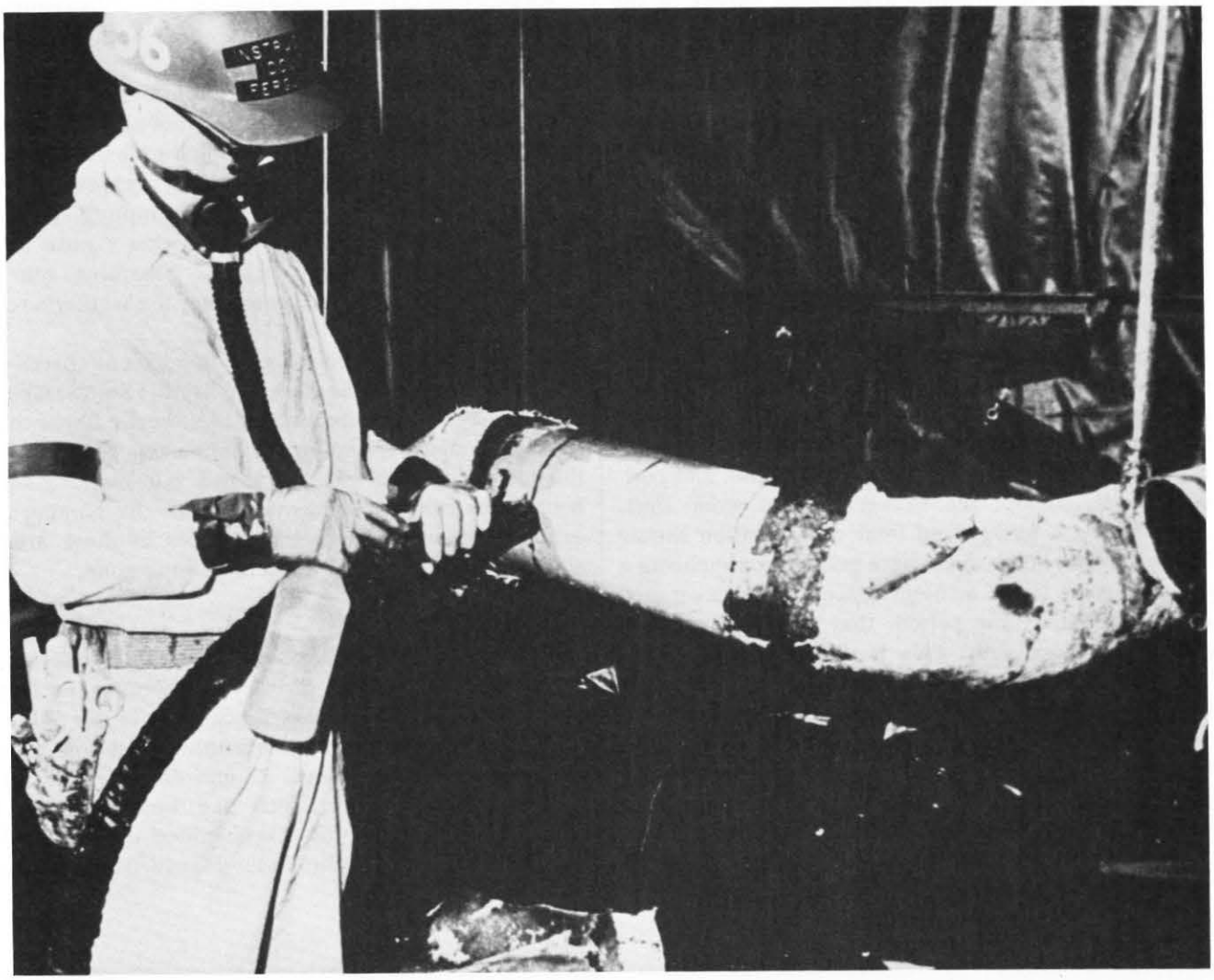

FIGURE 1. Asbestos-containing insulation being removed from a section of pipe. This is one example of a job where air samples should be collected before, during, and after the job.

asbestos fiber sampling program is knowing what, when, where, and how to sample for airborne asbestos fibers.

Sampling must be conducted on any job where airborne asbestos fibers are released. Only then can adequate control procedures be established and implemented. After such controls have been implemented additional sampling is superfluous, unless there are changes in the process, techniques, or material usage. If any changes occur, then new control procedures must be established based on additional data from a new sampling series. Once airborne fiber concentrations are lowered and brought to a permissible exposure level, further sampling is unwarranted, either on a financial or temporal basis. Sampling for numbers alone is not compatible with an effective asbestos sampling program.

Figure 1 is an example of a work process that must be sampled to determine appropriate engineering controls and personal protective equipment and monitoring. Asbestos insulation rip-out aboard ships and in shore facilities must be sampled and monitored closely because of the confined spaces in which asbestos-containing material can be found. Other examples of jobs that must be sampled, include installation/removal of asbestos-containing flooring, brake linings, gaskets, and packing.

If a job involves a material that is suspected of containing asbestos, bulk samples of the material should be collected for fiber identification by an industrial

hygienist. Before initiating a sampling survey of the job, positive fiber identification is necessary to avoid wasted time, money, and manpower.

An effective sampling program must be designed for accuracy and reliability. If this is accomplished, realistic spatiotemporal data will be obtained indicating fiber concentrations for that sampling period. Airborne fiber concentrations will vary for a variety of reasons, including worker mobility, changes in work practice, job processes, and air currents in the work space.(*2*) The amount of airborne dust present will also vary with environmental factors such as seasonality and various climatic factors.(*2*) Consequently, to adequately sample a worker's exposure to airborne fibers, sampling must be conducted on different days, under different weather conditions, during different seasons, during changes in worker production rate or routine, and periodically throughout the worker's entire work shift. Additionally, a background fiber concentration should be determined in the work space prior to commencing a job. Exposure is the ambient concentration, averaged over a specified time period, that a worker receives during his work shift. This is defined as the Time Weighted Average (TWA) exposure. The current TWA for airborne asbestos fibers is 2.0 fibers greater than five micrometers in length per cubic centimeter of air; this is the exposure level allowed for an 8-hour work period, and a 40-hour work week. Consequently, a sufficient number of samples need to be collected to determine the TWA throughout a complete job process.

An asbestos sampling program used to devise control procedures must involve collection of samples in a number of locations, especially the breathing zone area of the individual worker.(*2*) Areas adjacent to the work site, directly at the work site, and spaces adjacent to the work site need to be initially sampled to institute adequate control procedures. To obtain representative samples of respirable asbestos dust, sampling apparatus must be positioned near the worker's nose and mouth. Samples collected in the "breathing zone" represent dust which is likely to enter the worker's respiratory system.

Samples must also be collected in adjacent spaces to the work site and at the work site itself. These samples help in determining the amount of airborne fibers that occasional visitors or helpers might be exposed to while the job is in progress. From this information, safe boundaries can be established to limit the number of exposed personnel. Samples collected in these areas should also be obtained in the breathing zone.

Sampling Procedure

Airborne asbestos fibers are collected by using a sampling cassette and a battery operated vacuum pump.(*2*) The sampling cassette consists of the following pieces, in order from top to bottom: inlet plug, cap, two middle retaining rings, 37 mm diameter 0.8 micrometer pore size filter, filter pad, base, and outlet plug. Figure 2 shows the disassembled cassette with the filter and pad in the base; Figure 3 shows the

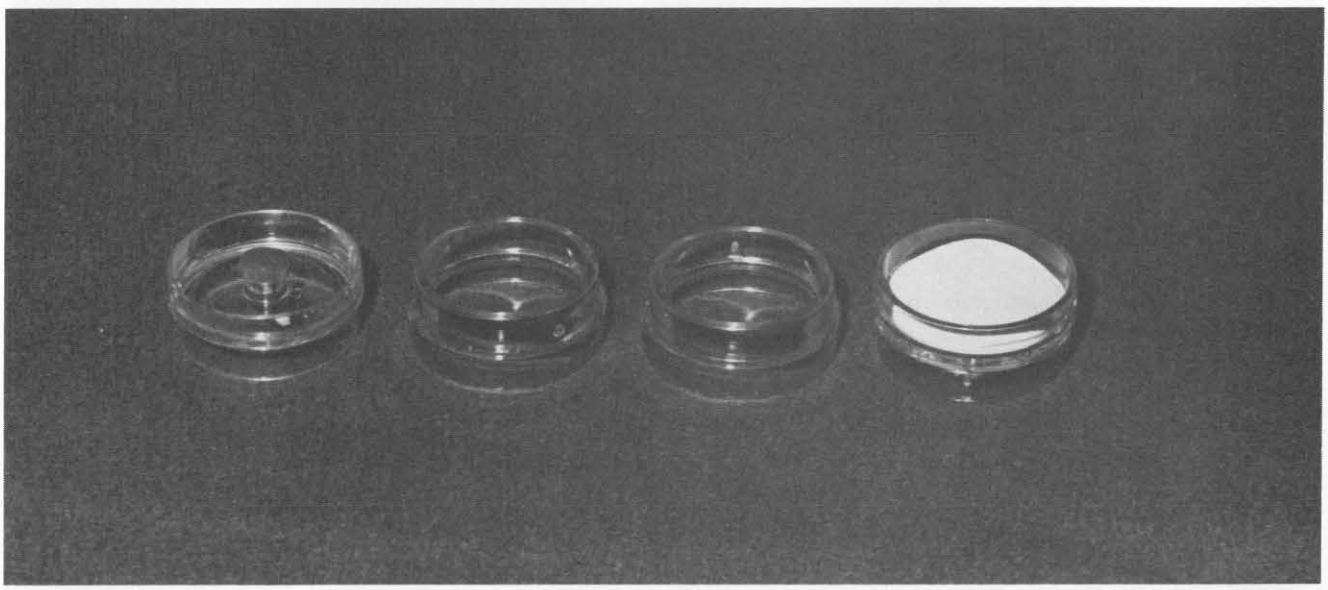

FIGURE 2. Airborne asbestos fiber sampling cassette. From left to right is the cap with inlet plug, the two center retaining rings, and the base containing filter, filter pad, and outlet plug.

cassette assembled and attached to the sampling pump.

The sampling pump is a light-weight, battery-operated vacuum pump which can easily be worn by a worker. This type of pump allows collection of air samples on a long-term basis in the worker's breathing zone without interfering with the work process. Prior to use, the pump must be calibrated to determine an accurate air flow rate. The accuracy of the sample analysis is dependent upon the accuracy of the volume of air drawn into the pump.(*2*) All calibrations must be conducted to an accuracy of $\pm 5\%$ for any flow rate between 1.0 and 2.5 liters per minute (1pm). Figure 3 shows one type of calibrator used for this purpose. It is important that the sampling pump be calibrated under the same conditions under which the sampler will be used in the field.(*2*) Pumps should be calibrated before and after each period of use.

The cassette is attached to the sampling pump by a short piece of noncollapsible tubing, having an inside diameter of 1/4 inch. The tubing should be of sufficient length to reach from the worker's waist, across the shoulder, and attach to the shirt lapel. Two spring clips should be attached to the tubing so that it can be clipped to the worker's shirt lapel and one other location. The sampling pump is simply attached to the worker's belt. When the cassette is attached to the lapel it should be in the breathing zone and facing in a downward position to avoid falling debris gathering on the filter. With the cassette in this position the cap is removed to allow a more uniform distribution of collected fibers across the entire surface of the filter. The flow rate should be set at a minimum of 1.0 1pm to a maximum of 2.5 1pm.(*2*)

Acceptable asbestos sampling times range from 15 minutes to 8 hours.(*2*) Duration for samples is dependent upon the following criteria: time weighted average, analytical method to be used, and suspected airborne concentration. If the sampling pump flow rate, TWA, and sensitivity of the analytical procedures are known, a minimum sampling time can be calculated prior to entering the work space. However, a preferable and recommended method is to sample the entire work process.(*2*) If the job process in question is of long duration, then the longer the sampling period, the more accurate and realistic the average concentration value. The fundamental reasoning for this procedure is that airborne fiber concentrations will vary with time and are dependent upon the operation.(*2*) In general, the short-term sampling period limitation should be a minimum of 15 minutes, but preferably 30 minutes, based on the number of fields to be counted and the number of fibers per field.(*2*) National Institute for Occupational Safety and Health states: "As many fields as required to yield at least 100 fibers should be counted. In general the minimum number of fields should be 20 and the maximum 100."(*2*) Fiber counts follow a Poisson distribution and these minimum values will yield a low variability of the count and greatly reduce the time spent counting the fibers.(*2*)

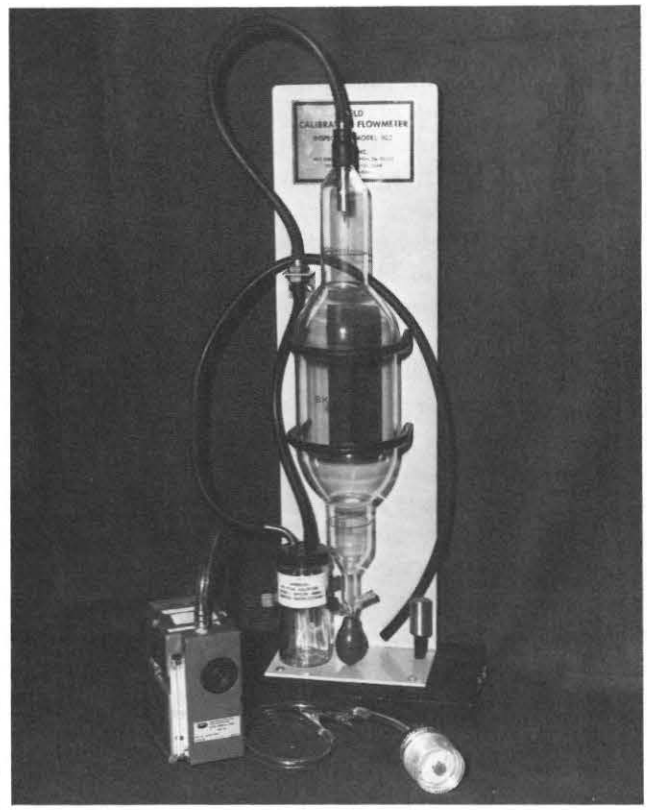

FIGURE 3. Personal sampling pump with attached sampling cassette. Instrument in the background is one type of calibrator used to calibrate the personal sampling pump. Sampling pump with cassette as shown is ready for field use.

Regardless of the length of the sampling period, replicate samples must be collected to determine a realistic estimated fiber exposure, whether the survey is for TWA concentrations or merely a job process exposure. The industrial hygienist must remember that the overall concern is the establishment of effective control procedures for worker health protection and not the collection of numbers for numbers sake. Consecutive samples collected over an entire work period probably offer the "best" measurement because this strategy provides very narrow confidence limits.(*8*) However, two consecutive samples collected for each four-hour period of the work shift will also insure sufficient accuracy and reduce additional overhead costs. If operational procedures make consecutive sampling dif-

ficult to perform, samples may be collected at random short-term intervals for the operation. This time interval should cover the time period that the standard is based on. Sampling of this type is commonly termed grab sample measurement.(8) If the grab sample technique is employed it is essential that 8 to 11 samples be collected to determine worker exposure, if exposure is relatively constant for the entire work shift. If exposure is not constant, 8 to 11 samples must be collected for each change in exposure concentration during the work shift. Sampling periods should be chosen entirely at random when the grab sample measurement technique is utilized. However, nonrandom selection is necessary if the exposure is to be compared with the ceiling value.(8) If exposure is to be compared with ceiling values, samples must be obtained during the period of maximum expected airborne concentrations. Samples collected for ceiling value comparison must be of a 15-minute duration, collected in the breathing zone, and triplicated for maximum usage. If three samples are collected for the work shift, error reduction is enhanced; however, only the highest value would be statistically tested.

The utmost criterion for establishing an airborne asbestos fiber sampling program is worker health protection. A valid, accurate, and realistic sampling program can be established by knowing what, when, where, and how to sample for airborne fibers. After controls have been instituted for a particular job, constant, continued sampling is unwarranted unless some aspect of the job has been altered. Occasional monitoring is sufficient to maintain up-to-date control procedures.

References

1. Marr WT: Asbestos Exposure During Naval Vessel Overhaul. *Industrial Hygiene J* 25:264-268, 1964.
2. National Institute for Occupational Safety and Health: Criteria for a Recommended Standard . . . Occupational Exposure to Asbestos. NIOSH Pub No. 72-10267, 1972.
3. Asbestos: A Clear and Present Danger. *U.S. Navy Medicine* 69(6):8-10, June 1978.
4. OPNAVINST 6260.1 of 9 April 1974; subj: Control of Asbestos Exposure to Naval Personnel and Environs.
5. General Industry Standards, 29 CFR 1910 para 1001, 1976.
6. Selikoff IJ, et al: Asbestos Air Pollution. *Arch Environ Health* 25:1-13, 1972.
7. National Institute for Occupational Safety and Health: Revised Recommended Asbestos Standard. NIOSH Pub No. 77-169, 1976.
8. Leidel NA, et al: Occupational Exposure Sampling Strategy Manual. NIOSH Pub No. 77-173, 1977.

Reservists Donate 78 Units of Blood

Concerned about cancer and sickness among children—officers, sailors, and marines at the Denver Navy and Marine Corps Reserve Center, donated 78 units of blood to two Denver organizations whose demand for blood is constant.

Thirty-five units of blood went to the American Cancer Society and 43 units of blood went to Children's Hospital.

LT Kathy Noll, director of the program and member of 3rd Marine Air Wing, Detachment 118, who implemented this donation program, let it be known that the blood, collected during the annual drive, if not used by reservists, families, or active duty personnel throughout the year, will be offered to worthy medical organizations.

PO3 Mary Walsh (left) gets her temperature taken electronically before giving blood. Karen Proett, lab technician, checks readout.

NEW OUTPATIENT WING FOR MARINE CORPS AIR-GROUND COMBAT CENTER

On 16 April a groundbreaking ceremony was held at Marine Corps Air-Ground Combat Center, Twentynine Palms for construction of a single-story outpatient wing to be added to the existing Branch Hospital. The 3,498 sq. ft. wing, to be completed by October 1979 at a cost of $459,292.00, will consist of 10 exam rooms, five doctors offices, an OB-GYN waiting room, and supporting facilities.

OBESITY PROGRAM FOR NRMC ORLANDO

The University of Central Florida will initiate a program of behavioral modification for obesity to be sponsored by the Naval Regional Medical Center, Orlando, Fla. in cooperation with the Nuclear Power School. The hospital staff will augment the program.

NAVY LAB TECHNICIAN BASICS (HM-8501) TO ATTEND FORT SAM HOUSTON

Advanced Histology Techs (HM-8503) will train at AFIP, Walter Reed Army Medical Center beginning in October 1979. Navy personnel assigned to Basic Laboratory Technician training will attend the 15-week course conducted by the U.S. Army at the Academy of Health Sciences, Fort Sam Houston, Texas. There will be 10 classes conducted per year and it is anticipated that 175 Navy Hospital Corpsmen will attend the program in FY-80. Prerequisites required for this training remain as detailed in the Catalog of Navy Training Courses (CANTRAC), NAVEDTRA 10500.

The Armed Forces Institute of Pathology (AFIP), at Walter Reed Army Medical Center in Washington, D.C. will serve as the Tri-Service training site for Advanced Histology Technician training commencing early FY-80. Classes, 20 weeks in duration, will be conducted twice yearly. This program replaces on-the-job training for Navy Advanced Histology Technicians.

Individuals must be graduates of the Basic Laboratory Technician (8501) program, or possess acceptable equivalent experience, to qualify for assignment to the 8503 training program. Complete information on the program is being provided in the near future.

Personnel desiring to attend Navy Medical Department advanced specialty training programs should submit their applications in accordance with the provisions of BUMEDINST 1510.10D.

BARBADOS, W.I. BRANCH CLINIC CLOSED

On 31 March 1979 the U.S. Naval Hospital, Roosevelt Roads, Puerto Rico disestablished the Branch Clinic located at the U.S. Naval Facility, Barbados, West Indies.

FOUR NAVAL HOSPITALS TO BE REPLACED BY OUTPATIENT CLINICS

The Naval Hospitals at Port Hueneme, Annapolis, Quantico, and Key West will be closed and replaced with outpatient clinics according to the recent Shore Establishment Realignment announced by SECNAV on 29 March. The SER will go into effect 1 June.

Surgeon General Honored

The American Medical Society on Alcoholism, a component of the National Council on Alcoholism Inc. recently presented a medal to VADM Willard P. Arentzen commemorating his ". . . outstanding contributions to the advancement of knowledge about alcoholism and in grateful recognition of unstinting dedication to healing the sick and troubled victims of this illness."

CAPT Joseph Zuska, MC, USN (Ret.) presents award.

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